

What is claimed is:

1 1. A retrofocus, wide-angle lens formed of two lens groups, in order from the object side, as  
2 follows:

3 a first lens group having negative refractive power;

4 a stop; and

5 a second lens group having positive refractive power;

6 wherein

7 said first lens group includes a meniscus lens element having positive refractive power  
8 with its convex surface on the object side, two meniscus lens elements, each of negative  
9 refractive power with its convex surface on the object side, and a lens that has a center thickness  
10 that is greater than the center thickness of any of said three meniscus lens elements; and

11 said second lens group includes a cemented lens component that includes a lens element  
12 having negative refractive power that is cemented to a biconvex lens element, an air space, and a  
13 meniscus lens component having negative refractive power with its concave surface on the object  
14 side.

1 2. The retrofocus, wide-angle lens of claim 1, wherein said meniscus lens component of said  
2 second lens group consists of a lens element.

1 3. The retrofocus, wide-angle lens of claim 2, wherein said meniscus lens component of said  
2 second lens group is separated from said biconvex lens element only by said air space.

1 4. The retrofocus, wide-angle lens of claim 3, wherein the following condition is satisfied:

2 
$$1 < |R / R'| < 1.08$$

3 where

4 R is the radius of curvature of the object-side lens surface of said meniscus lens  
5 component of said second lens group; and

6 R' is the radius of curvature of the image-side lens surface of said biconvex lens element.

1 5. The retrofocus, wide-angle lens of claim 1, wherein said meniscus lens component of said  
2 second lens group is separated from said biconvex lens element only by said air space.

1 6. The retrofocus, wide-angle lens of claim 5, wherein the following condition is satisfied:

2 
$$1 < |R / R'| < 1.08$$

3 where

4 R is the radius of curvature of the object-side lens surface of said meniscus lens  
5 component of said second lens group; and

6 R' is the radius of curvature of the image-side lens surface of said biconvex lens element.

1 7. The retrofocus, wide-angle lens of claim 1, wherein the following condition is satisfied:

2 
$$1 < |R / R'| < 1.08$$

3 where

4 R is the radius of curvature of the object-side lens surface of said meniscus lens  
5 component of said second lens group; and

6 R' is the radius of curvature of the image-side lens surface of said biconvex lens element.

1 8. The retrofocus, wide-angle lens of claim 2, wherein the following condition is satisfied:

2 
$$1 < |R / R'| < 1.08$$

3 where

4 R is the radius of curvature of the object-side lens surface of said meniscus lens  
5 component of said second lens group; and

6 R' is the radius of curvature of the image-side lens surface of said biconvex lens element.

1 9. The retrofocus, wide-angle lens of claim 4, wherein the following conditions are satisfied:

2 
$$v_B - v_A > 25$$

3 
$$v_B > 65$$

4 
$$1.38 < |\varphi / R'| < 1.65$$

5 where

6 vA is the Abbe number at the d-line of the lens material of the lens element having

negative refractive power of the cemented lens component of the second lens group;

$\nu_B$  is the Abbe number at the d-line of the lens material of said biconvex lens element of the second lens group; and

$\phi$  is the effective diameter of the image-side lens surface of said biconvex lens element of the second lens group.

10. The retrofocus, wide-angle lens of claim 6, wherein the following conditions are satisfied:

$$\nu_B - \nu_A > 25$$

$$\nu_B > 65$$

$$1.38 < |\phi / R'| < 1.65$$

where

$\nu_A$  is the Abbe number at the d-line of the lens material of the lens element having negative refractive power of the cemented lens component of the second lens group;

$\nu_B$  is the Abbe number at the d-line of the lens material of said biconvex lens element of the second lens group; and

$\phi$  is the effective diameter of the image-side lens surface of said biconvex lens element of the second lens group.

11. The retrofocus, wide-angle lens of claim 7, wherein the following conditions are satisfied:

$$\nu_B - \nu_A > 25$$

$$\nu_B > 65$$

$$1.38 < |\phi / R'| < 1.65$$

where

$\nu_A$  is the Abbe number at the d-line of the lens material of the lens element having negative refractive power of the cemented lens component of the second lens group;

$\nu_B$  is the Abbe number at the d-line of the lens material of said biconvex lens element of the second lens group; and

$\phi$  is the effective diameter of the image-side lens surface of said biconvex lens element of the second lens group.

12. The retrofocus, wide-angle lens of claim 8, wherein the following conditions are satisfied:

$$v_B - v_A > 25$$

$$v_B > 65$$

$$1.38 < |\varphi/R'| < 1.65$$

where

$v_A$  is the Abbe number at the d-line of the lens material of the lens element having negative refractive power of the cemented lens component of the second lens group;

$v_B$  is the Abbe number at the d-line of the lens material of said biconvex lens element of the second lens group; and

$\varphi$  is the effective diameter of the image-side lens surface of said biconvex lens element of the second lens group.

13. The retrofocus, wide-angle lens of claim 1, wherein the following conditions are satisfied:

$$v_B - v_A > 25$$

$$v_B > 65$$

$$1.38 < |\varphi/R'| < 1.65$$

where

$v_A$  is the Abbe number at the d-line of the lens material of the lens element having negative refractive power of the cemented lens component of the second lens group;

$v_B$  is the Abbe number at the d-line of the lens material of said biconvex lens element of the second lens group;

$\varphi$  is the effective diameter of the image-side lens surface of said biconvex lens element of the second lens group; and

$R'$  is the radius of curvature of the image-side lens surface of said biconvex lens element.

14. The retrofocus, wide-angle lens of claim 9, wherein said second lens group comprises, in order from the object side:

the meniscus lens component having positive refractive power with its convex surface on the image side;

5 the lens element of said cemented lens component having negative refractive power;  
6 the biconvex lens element of said cemented lens component;  
7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and  
9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 15. The retrofocus, wide-angle lens of claim 10, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and

9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 16. The retrofocus, wide-angle lens of claim 11, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and

9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 17. The retrofocus, wide-angle lens of claim 13, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and

9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 18. The retrofocus, wide-angle lens of claim 1, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and

9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 19. The retrofocus, wide-angle lens of claim 12, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface

8 on the object side; and  
9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.

1 20. The retrofocus, wide-angle lens of claim 8, wherein said second lens group comprises, in  
2 order from the object side:

3 the meniscus lens component having positive refractive power with its convex surface on  
4 the image side;

5 the lens element of said cemented lens component having negative refractive power;

6 the biconvex lens element of said cemented lens component;

7 the meniscus lens component having negative refractive power with its concave surface  
8 on the object side; and

9 a second meniscus lens component having positive refractive power with its convex  
10 surface on the image side.